

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference 156038/OS/BF	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/NO 03/00368	International filing date (day/month/year) 03.11.2003	Priority date (day/month/year) 23.06.2003
International Patent Classification (IPC) or both national classification and IPC G01S7/02		
Applicant TELEFONAKTIEBOLAGET LM ERICSSON (PUBL) et al.		



- This International preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 6 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

- This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 17.01.2005	Date of completion of this report 07.07.2005
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International application No. **PCT/NO 03/00368**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-13 as originally filed

Claims, Numbers

1-13 as originally filed

Drawings, Sheets

1-11 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	3-7,9-13
	No: Claims	1,2,8
Inventive step (IS)	Yes: Claims	9-13
	No: Claims	1-8
Industrial applicability (IA)	Yes: Claims	1-13
	No: Claims	

2. Citations and explanations

see separate sheet

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1. Of the documents (D) cited in the International Search Report, the following is considered to form the closest state of the art with respect to the application:

D1: US-A-4 700 191 (MANOR DAN) 13 October 1987 (1987-10-13)

2. D1 discloses in figures 2 and 3 a method for detecting the presence of a radar signal emitter (column 1, lines 5 to 6) comprising

- receiving said radar signals by a number of antennas, said antennas pointing in different directions (column 4, lines 39 to 40) and each antenna covering a sector of the surrounding area,
- splitting the signals received from the antennas into a number of first sub-bands (figure 2, triplexer 16),
- converting said first sub-bands into a baseband channel (figure 2, mixer 20 and local oscillator 30),
- summing all baseband channels forming a common baseband channel (column 5, lines 45 to 53, "Omnidirectional mode"),
- digitalizing the signals in a baseband channel (figure 3;56) and processing the digitized signals in order to detect and identify the emitter source (figure 3;computer 60, column 5, lines 63 to 66).

D1 also discloses an Electronic Support Measures unit (see title) for detecting and identifying radars present in an area (abstract, 1st sentence), comprising a number of antenna sets, each antenna set including at least one antenna and each set covering a sector of the surrounding area (figure 2;15, column 4, lines 39 to 40), a number of receiver front ends (figure 2), each receiver front end being connected to an antenna set (15) covering a specific sector, a number of first band-pass filters (16) connected to a first antenna set, said band-pass filters splitting the signals received from the first antenna set into a number of sub-bands, a number of low noise preamplifiers (LNA 1,2), each connected with its input to a first band-pass filter and the output connected to one of a corresponding number of mixers (20), said mixers being adapted to convert a sub-band into baseband, the output of the mixer being fed to a second band-pass filter (figure 2;26, column 5, lines 17 to 18), the outputs of all second band-pass filters being fed to an adder (46, column 5, lines 45 to 53, "omnidirectional mode"), said adder (46) being adapted to combine the signals received from the second band-pass filters into a common baseband frequency channel, an Analog-to-Digital converter (figure 3;56) connected to said adder (46) and being adapted to digitalize the signals received from said adder and a signal processing unit (figure 3; computer 60) receiving the signal from the Analog-to-Digital converter.

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In view of column 5, lines 21 to 25, the "common baseband frequency channel" mentioned above covers the range of 2.5 to 5.0 GHz and thus can be also regarded as a "common intermediate frequency channel" (1st IF) in the sense of claim 9. D1 also discloses the following features of claim 9:

a number of receiver second stages (51-55; see figure 4), each connected to a receiver front end and receiving said common intermediate frequency channel (1-4), said intermediate frequency channel being fed to a number of third band-pass filters (68) in order to split said common intermediate frequency channel into a number of second sub-bands, the output of each third band-pass filter being fed to a second amplifier (see fig. 4), the output of the second amplifier being fed to a second mixer (66), said second mixer being adapted to convert said intermediate frequency channel into baseband, the output of the second mixer being fed to a fourth band-pass filter (72, column 6, lines 41 to 44).

3. The subject-matter of independent claims 1 and 8 and dependent claim 2 is consequently known from D1 and thus lacks novelty, Article 33(2) PCT.

4. The subject-matter of claim 9 is novel, Article 33(2) PCT, in that it differs from D1 in that the outputs of all fourth band-pass filters are fed to a second adder (32), said second adder (32) being adapted to combine the signals received from the fourth band-pass filters (30a -30d) into a common baseband channel, an Analog-to-Digital converter (35) connected to said second adder (32) and being adapted to digitize the signals received from said second adder (32), a signal processing unit (9) receiving the signal from the Analog-to-Digital converter (35).

These difference features have the effect of that all frequency ranges and directions can be monitored by one receiver channel, rather than a plurality. Whilst the skilled person would consider the objective technical problem of simplifying the Electronic Support Measures unit known from D1 as a usual matter of design, the solution of adding all channels together, as set out in claim 9, is not obvious, since there is a risk of signal collision between the channels. The Applicant has however realized (page 6, lines 14 to 16 of the description) that such a measure is nevertheless possible, since the probability of simultaneous signals is "quite low". The subject matter of claims 9 to 12 consequently satisfies Article 33(3) PCT regarding inventive step.

5. The features set out in dependent claim 3 are regarded as a usual implementation

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of the frequency and IDF (instantaneous direction finding) mentioned in D1 at column 1, lines 13 to 16. The processing method steps set out in dependent claims 4 to 7 are regarded as usual implementations of those set out in D1 at column 9, lines 30 to 63.

Hence the subject-matter of claims 3 to 7 does not satisfy Article 33(3) PCT regarding inventive step.

6. Since D1 contains no hint at connecting a plurality of Electronic Support Measures units by a network, the subject-matter of claim 13 satisfies Article 33(3) PCT regarding inventive step.

7. The subject matter of all claims is regarded as industrially applicable, Art. 33(4) PCT.